

1 MICROCOIL VASO-OCLUSIVE DEVICE WITH MULTI-AXIS
2 SECONDARY CONFIGURATION
3

4 ABSTRACT OF THE DISCLOSURE

5 A vaso-occlusive device includes a microcoil formed into a minimum
6 energy state secondary configuration comprising a plurality of curved
7 segments, each defining a discrete axis, whereby the device, in its minimum
8 energy state configuration, defines multiple axes. In a preferred embodiment,
9 the secondary configuration comprises a plurality of interconnected closed
10 loops defining a plurality of discrete axes. In a second embodiment, the
11 secondary configuration defines a wave-form like structure comprising an
12 array of laterally-alternating open loops defining a plurality of separate axes.
13 In a third embodiment, the secondary configuration forms a series of
14 tangential closed loops, wherein the entire structure subtends a first angle of
15 arc, and wherein each adjacent pair of loops defines a second angle of arc. In
16 a fourth embodiment, the secondary configuration forms a logarithmic spiral.
17 In all embodiments, the device, in its secondary configuration, has a
18 dimension that is substantially larger than the largest dimension of the
19 vascular site (i.e., aneurysm) in which it is to be deployed. Thus, confinement
20 of the device within an aneurysm causes it to assume a three-dimensional
21 configuration with a higher energy state than the minimum energy state.
22 Because the minimum energy state configuration of the device is larger (in at
23 least one dimension) than the aneurysm, the deployed device is constrained
24 by its contact with the walls of the aneurysm from returning to its minimum
25 energy state configuration. The engagement of the device with the aneurysm
26 wall minimizes shifting or tumbling due to blood flow. Furthermore, the
27 secondary configuration is not conducive to “coin stacking,” thereby
28 minimizing the compaction experienced.